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(54) ACARINE ATTRACTANT AND METHOD FOR EXTERMINATING ACARID

(57)Abstract:

PROBLEM TO BE SOLVED: To obtain an attractant showing remarkable acarine attractivity for acarids which are in hiding in the in-depth parts of a straw mat (Tatami), a carpet, the bedding, or the like, and to provide a method for efficiently exterminating acarids.

SOLUTION: This acrid attractant is prepared by making a solid support having a volume of 5×10^{-4} mm³ to 350 mm³ retain an acarid-attracting substance in a liquid state at normal temperature, and the method for exterminating acarids is to use this attractant.

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CLAIMS

[Claim(s)]

[Claim 1] the attractant of Acari which is a liquid in ordinary temperature -- the volume -- $5 \times 10^{-4} \text{mm}^3 - 350 \text{mm}^3$ it is -- tick attractant characterized by making it come to hold to solid support.

[Claim 2] One sort as which the attractant of Acari which is a liquid is chosen from the group of a tetrahydro geraniol, a geraniol, a nerol, linalool, and citronellol in the above-mentioned ordinary temperature. One sort chosen from the group of an acetic acid, a propionic acid, butanoic acid, and an isobutyric acid of ester Benzyl propionate, nerolidol, a terpineol, n nonyl alcohol. The tick attractant according to claim 1 characterized by being one or more sorts of compounds chosen from the group which consists of a farnesol, a citral diethyl acetal, a geranyl acetone, a tetrahydro geraniol, a geraniol, a nerol, linalool, and citronellol.

[Claim 3] The Acari extermination approach which attracts Acari and is behind characterized by carrying out attraction extermination of this attractant and the attracted ticks with an attraction machine by sprinkling a tick attractant according to claim 1 or 2 in a tatami, a carpet, bedding, etc.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the tick attractant and the tick extermination approach of having a high induction effect to Acari.

[Description of the Prior Art] In recent years, temperature space comfortable all the year round is realized for the spread of air conditionings, and sealing nature increases with improvement in the amenity of a domicile, and lifting of humidity is caused. For these reasons, propagation of inside nature Acari of a domicile and many [especially] Chile Dani in house dust leading to the allergosis domestic [general] has become remarkable, and the extermination is called for. Moreover, it has been the conditions which mold tends to generate indoors with lifting of humidity, and this mold is urged to generating of an acarid mite by food. An acarid mite serves as allergen like above-mentioned Chile Dani, and also serves as food of predatism Dani, such as pawl ticks, and causes the bite damage in ordinary homes. Conventionally, as an approach of exterminating these Dani, a physical method, such as heating and carrying out attraction capture with the chemical approaches, such as smoking of the ** Dani fumigant which sprinkles ** Dani spray, or a cleaner, is taken.

[0002] However, in the case where ** Dani spray and the ** Dani fumigant are used, since a drug cannot permeate the interior, such as a tatami, a carpet, and bedding, easily, even if the ** Dani effectiveness is fully able to kill Dani, Dani's cadaver will remain in the interior, and it will be gradually discharged by the life space, and will become the cause of the allergosis. Moreover, a large-scale heater is required for heating extermination in order to put a tatami, a carpet, bedding, etc. into a heater, and it is difficult extermination to use it at ordinary homes. Although the approach of carrying out attraction capture with a cleaner is a simple approach, it cannot be effectively captured by this approach about what has hung on to what is in the depths section very much although some Dani can capture and fiber of the surface section.

[0003]

[Problem(s) to be Solved by the Invention] For this reason, the method of exterminating attracted Dani is indicated by JP,64-23840,A, using the good **** organic substance of the shape of a grain, such as Ebios, as Dani attractant. However, there is a trouble that an induction effect is hardly accepted at solid-state-like attractant since attractant cannot permeate even the interior easily when it is lacking in vaporization nature and sprinkles in a tatami, a carpet, bedding, etc., in ordinary temperature.

[0004] For this reason, this invention aims at offering the efficient extermination approach using the attractant and this which show the remarkable Dani attractiveness also to Acari lurking in the depths sections, such as a tatami, a carpet, and bedding, in view of the trouble of the above-mentioned conventional Dani attractant.

[0005]

[Means for Solving the Problem] the attractant of Acari which is a liquid in ordinary temperature in this invention according to claim 1 in order to attain the above-mentioned object — the volume — $5 \times 10^{-4} \text{mm}^3 - 350 \text{mm}^3$ it is — the Dani attractant characterized by making it come to hold to solid support is offered. Moreover, one sort as which the attractant of Acari which is a liquid is chosen from the group of a tetrahydro geraniol, a geraniol, a nerol, linalool, and citronellol in the above-mentioned ordinary temperature in this invention according to claim 2, One sort chosen from the group of an acetic acid, a propionic acid, butanoic acid, and an isobutyric acid of ester Benzyl propionate, nerolidol, a terpineol, n nonyl alcohol, The Dani attractant according to claim 1 characterized by being one or more sorts of compounds chosen from the group which consists of a farnesol, a citral diethyl acetal, a geranyl acetone, a tetrahydro geraniol, a geraniol, a nerol, linalool, and citronellol is offered. Moreover, in this invention according to claim 3, by sprinkling the Dani attractant according to claim 1 or 2 in a tatami, a carpet, bedding, etc., Acari is attracted and the Acari extermination approach characterized by carrying out attraction extermination of this attractant and attracted Dani with an attraction machine behind is offered.

[0006] If it is a liquid in ordinary temperature and the Acari attracting action is shown as Dani attractant in this invention One sort which is not limited, for example, is especially chosen from the group of a tetrahydro geraniol, a geraniol, a nerol, linalool, and citronellol, One sort chosen from the group of an acetic acid, a propionic acid, butanoic acid, and an isobutyric acid of ester Benzyl propionate, nerolidol, a terpineol, n nonyl alcohol, A farnesol, a citral diethyl acetal, a geranyl acetone, A tetrahydro geraniol, a geraniol, a nerol, linalool, One or more sorts of compounds chosen from the group which consists of citronellol, a chocolate flavor, Food flavors, such as an almond flavor and a cheese-head flavor Methoxybenzene derivatives, such as an anisole and an eugenol, myristic-acid ester, Straight-chain fatty acid, such as aliphatic series ester, such as palmitic-acid ester and linoleic ester, stearin acid, oleic acid,

and a vaccenic acid, beta - Sex pheromones, such as an AKARIJI R, etc. are mentioned. They are one sort chosen from the group of a tetrahydro geraniol, a geraniol, a nerol, linalool, and citronellol, and one sort chosen from the group of an acetic acid, a propionic acid, butanoic acid, and an isobutyric acid of ester, benzyl propionate, nerolidol, a terpineol, n nonyl alcohol, a farnesol, a citral diethyl acetal, and a geranyl acetone especially preferably in it. These may be used independently or may use two or more sorts together.

[0007] Moreover, the ordinary temperature in this invention means 15-25 degrees C.

[0008] As amount of the above-mentioned attractant used, it is 2 1m of tick-ed extermination objects, such as a tatami, a carpet, and bedding. It is desirable to set up the amount held to solid support so that it can vaporize in 5mg - 10g of hits. The amount of vaporization is 2 1m. When it is less than 5mg of hits, sufficient induction effect is not acquired, and it is 2 1m. In crossing 10g of hits, a smell is strongly unpleasant or nonconformity, such as becoming the cause of it being dyed and deteriorating attractant in a tick-ed extermination object, happens.

[0009] The approach which especially the method of making the above-mentioned attractant hold to the solid support which carries out the following is not limited, for example, carries out a fixed time amount dipping of the solid support to the above-mentioned attractant which is a liquid in ordinary temperature, the approach of carrying out the spray of the attractant to solid support, etc. are mentioned.

[0010] In order to adjust the vaporization nature of the above-mentioned attractant, it is effective to also make vaporization nature inhibitors, such as vaporization disposition top agents, such as ethanol, and a glycol, hold to support with attractant also besides adjusting the amount of attractant maintenance of solid support.

[0011] the solid support in this invention -- the volume -- 5x10-4mm³ -350mm³ it is -- things -- desirable -- further -- desirable -- 4x10-3 mm³ -125mm³ it is . The volume is 5x10 to 4 mm³. When carrying out attraction extermination of Dani to it being the following with an attraction machine, clearances, such as a tatami, a carpet, and bedding, etc. are entered and it becomes difficult to carry out attraction clearance. Moreover, 350mm³ If it exceeds, the attraction machine of a big path is needed and attraction clearance will become too simple less.

[0012] Especially the configuration of the above-mentioned solid support is not limited, for example, may have what kind of forms, such as the shape of a globular form, flatness, and a needle.

[0013] What was not limited as construction material of the solid support in this invention especially when the above-mentioned attractant could be held, for example, mixed silica gel, activated carbon, hydroxyapatite, an alumina, a zeolite, a calcium silicate, a calcium carbonate, sodium bicarbonate, diatomaceous earth, a clay mineral, gel, a pulp cast, paper, a nonwoven fabric, fiber, resin, and these is mentioned.

[0014] As amount of the above-mentioned solid support used, it is 2 1m of tick-ed extermination objects, such as a tatami, a carpet, and bedding. It is desirable that it is hit 0.5-100g. 0. In less than 5g, when sprinkling to homogeneity cannot attract Dani effectively difficultly but it uses it exceeding 100g, the time and effort sprinkled in a tatami, a carpet, bedding, etc. increases, and there is an activity top problem.

[0015] A coloring agent etc. can be made to add and color it the Acari attractant of this invention if needed. When the Acari attractant is transparent, in order to make intelligible especially the spraying situation sprinkled in a tatami, a carpet, bedding, etc., it is desirable to make it color. As the above and a coloring agent, inorganic coloring matter, such as talc, a kaolin, a bentonite, a mica, titanium, ** NGARA, and calamine, is mentioned in organic coloring matter, such as red No. 2, blue No. 1, red No. 202, yellow No. 201, green No. 204, and purple No. 201, and the end of aluminum, for example. These coloring agents may be used independently or may use two or more sorts together.

[0016] Moreover, in the Acari attractant of this invention, the conventionally well-known compound of extent which does not spoil the Acari induction effect may be contained if needed. As such a compound, an insecticide, a synergist, a rat repellent, an anti-oxidant, and a stabilizing agent are mentioned, and further various kinds of germicides, an antifungal agent, a noxious insect repellent, a deodorant, and antiseptics may be added, for example.

[0017] Especially as the above-mentioned germicide, it is not limited, for example, a benzalkonium chloride, benzethonium chloride, chlorination alkyl trimethylammonium, resorcinol, a phenol, a sorbic acid, sorbic acid potassium salt, a salicylic acid, hexachlorophene, etc. are mentioned. These germicides may be used independently or may use two or more sorts together.

[0018] Especially as the above-mentioned antifungal agent, it is not limited, for example, 2, 4, 4' - TORIKURORO 2'-hydro KISHIJI phenyl ether, etc. are mentioned. These antifungal agents may be used independently or may use two or more sorts together.

[0019] Especially as the above-mentioned noxious insect repellent, it is not limited, for example, 2, 3, 4, and 5-screw butylene-tetrahydro FURARU etc. is mentioned. These noxious insect repellents may be used independently, or may use two or more sorts together.

[0020] Especially as the above-mentioned deodorant, it is not limited, for example, lauryl acid methacrylate, various flavonoid, etc. are mentioned. These deodorants may be used independently or may use two or more sorts together.

[0021] Especially as the above-mentioned antiseptics, it is not limited, for example, methyl p-hydroxybenzoate, p-oxy-ethyl benzoate, a benzoic acid, sodium benzoate, etc. are mentioned. These antiseptics may be used independently or may use two or more sorts together.

[0022] By sprinkling the Dani attractant of this invention in a tatami, a carpet, bedding, etc., the Dani extermination approach in this invention attracts Acari, and exterminates this attractant and attracted Dani behind.

[0023] Even if it is not limited but scatters by hand etc. especially as an approach of sprinkling the Dani attractant of this invention, it does not matter even if it installs in homogeneity at fixed spacing, but when carrying out Dani extermination of the whole, such as a tatami, a carpet, and bedding, it is desirable to sprinkle so that each tick attractants may be set to less than 1m. When it sprinkles exceeding 1m, it becomes difficult to attract Dani from the

whole, such as a tatami, a carpet, and bedding.

[0024] After sprinkling the Dani attractant, as for the time amount which attracts Acari until it exterminates, it is desirable that it is 10 minutes or more. When Dani's attractant fully permeates a tatami, a carpet, bedding, etc. and attractant acts on Acari, in order to induce Dani a surface, it is required 10 minutes or more. Furthermore, it is 1 hours or more preferably.

[0025] After attracting Dani, especially the method of exterminating this attractant and Acari is not restricted, but attraction extermination is carried out with an attraction machine, or approaches, such as sweeping with a broom, are used. It is desirable to use the approach of carrying out attraction extermination with an attraction machine also especially in it. Although it is simple for it not to be limited, for example, to use a vacuum cleaner for home use especially as an equipment used for attraction extermination, it is also possible to use the attraction machine using a vacuum pump etc.

[0026] As the Acari extermination approach of this invention, the binder is applied to the front face of the solid support which made the Acari attractant hold, or a sheet, a bead, etc. which applied the binder near the solid support are installed in it, and after capturing attracted Acari with a binder, it is also possible to carry out attraction clearance with an attraction machine. The matter which is not limited, for example, has adhesiveness, such as a binder of acrylic and a rubber system and an agar, and clay mineral gel, especially as the above-mentioned binder can be used.

[0027] The Acari attractant by this invention can also use together and use a ***** Dani component, mixing, or both. That is, Acari is induced surfaces, such as a tatami, a carpet, and bedding, by the Acari attractant, and after killing of a ** Dani component, attraction clearance can be carried out with an attraction machine. Especially as a ***** Dani component, it is not limited, for example, a pyrethroid system, an organic phosphorus system, a carver mate system, vegetable essential oil, etc. are mentioned.

[0028] The Acari extermination approach of this invention can also be combined with the existing Dani detection / detection approach and equipment. Although the Dani detection / detection approach of these existing and especially an equipment gestalt are not limited, an approach, equipment, etc. which detect Dani using the reagent which reacts with the Acari polypide, the component in body fluid, etc., and colors Acari after drawing in with an attraction machine and Dani's urine, stools, etc., for example can be illustrated. Moreover, the detection approach and equipment using an antigen-antibody reaction can also be used.

[0029] Target Acari in this invention is an arthropod. - It is the living thing of Arachnida-Acarina and is mainly 7. It is divided into the suborder of **. The back spiracle represented by reed NAGADANI. Four spiracles represented by KATADANI. The posterior spiracle represented by YAMATODA 2 and TSUBAMEHIMEDANI. A spiracle while being represented by a house dust mite and tin mesa SHIDANI. The spiracle before being represented by stag beetle pawl ticks and NAMIHOKORIDANI. Apneustic [which is represented by KENAGAKONADA 2 and Dermatophagooides pteronyssinus]. ***** represented by the IESA salad 2 and KAZARIHIWADA 2. It can be applicable by any class.

[0030] (Operation) The Dani attractants in this invention are the above configurations, and the Dani attractant is using the compound of a liquid in ordinary temperature. In order for this to attract Acari, in ordinary temperature in solid-state-like attractant Since attractant cannot permeate even the interior easily when it is lacking in vaporization nature and sprinkles in a tatami, a carpet, bedding, etc., It does not fully act on Acari and an induction effect is hardly accepted, but on the other hand, when the attractant of Acari is a gas in ordinary temperature, it is a home and is because it is difficult to make it act on a tatami, a carpet, bedding, etc. moreover, the attractant of above-mentioned Acari -- the volume -- 5x10-4mm³ -350mm³ it is -- although it makes it come to hold to solid support, since it is the need for 10 minutes to about 1 hour in order to attract Acari, it is because the amount of vaporization of attractant can be adjusted and attractant can be made to act on Acari continuously by holding to solid support which was described above. Although the Acari attractant is sprinkled in a tatami, a carpet, bedding, etc., Acari is attracted and attraction extermination of a attractant and Dani is carried out with an attraction machine by the Dani extermination approach of this invention behind, it becomes possible to carry out attraction extermination by this to Acari which is in the depths section of an exterminated object.

[0031]

[Example] Although an example is given to below and this invention is explained in more detail, this invention is not limited to these examples.

[0032] (Example 1) The thing which made 150mg (the Wako Pure Chem make, extra pure reagent) of benzyl propionates hold with a spray as attractant of Acari to MIZUKA night HQ-3(Mizusawa chemistry company make, particle diameter [of 3mm], and volume 14mm³)1g which is solid support was made into the Acari attractant.

[0033] (Example 2) The thing which made 100mg (the Wako Pure Chem make, extra pure reagent) of geranyl acetate hold with a spray as attractant of Acari to B mold silica gel (product made from Tokai chemistry, particle diameter [of 4mm], volume 34mm³) 400mg which is solid support was made into the Acari attractant.

[0034] (Example 3) The thing which made nerolidol (Wako Pure Chem make the 1st class) 500mg which is the attractant of Acari hold with a spray to flow light RM-20(Tokuyama make, particle diameter [of 2mm], volume 4mm³) 2g which is solid support was made into the Acari attractant.

[0035] (Example 4) The thing which made what mixed 100mg (Wako Pure Chem make the 1st class) of geranyl acetate which is the attractant of Acari, and 80mg (Wako Pure Chem make the 1st class) of benzyl propionates hold to MIZUKA night HQ-3(product made from Mizusawa chemistry, particle diameter of 3mm)1g which is solid support was made into the Acari attractant.

[0036] (Example 1 of a comparison) The following model carpet trial was performed without using the Acari

attractant.

[0037] (Example 2 of a comparison) 2g of things which fabricated Ebios (Asahi Breweries, Ltd. make) which is the solid-state-like Acari attractant in particle diameter of 1mm (volume 0.5mm³) was used as an Acari attractant.

[0038] (Example 3 of a comparison) The thing which made 1g (the Wako Pure Chem make, extra pure reagent) of benzyl propionates which are the attractant of Acari hold with a spray in 5g (the product made from **** industry, the particle diameter of 9mm, and volume 381mm³) of boiled-mixture-of-rice-and-barley stones which are solid support was made into the Acari attractant.

[0039] (Example 4 of a comparison) The calcium silicate which is solid support in 100mg (Wako Pure Chem make the 1st class) of geranyl acetate which is the attractant of Acari is ground, and it is the particle diameter of 50-80 micrometers. The thing made to hold to the 0.5 g thing screened and carried out was made into the Acari attractant.

[0040] The carpet (product made from polypropylene) of <model carpet test> marketing is cut to 30cmx30cm, and 500 Dermatophagooides pteronyssinus is installed in the cut carpet fragment. After carrying out 1 evening neglect, the Acari attractant of the above-mentioned examples 1-4 and the examples 2-4 of a comparison is sprinkled so that it may become homogeneity. After leaving it for 3 hours, it applied for about 10 seconds with the home vacuum cleaner (Dancing Girl 510, SANYO Electric Co., Ltd. make), the carpet fragment was cleaned, the following trials were performed, and it asked for the Dani elimination factor.

[0041] (The number measurement of Dani) The cotton cloth of the same magnitude is put on a carpet fragment, and it carries on the hot plate adjusted to the skin temperature of 55 degrees C, and heats for 1 hour, and Dani is driven out on a cotton cloth. Next, the cotton cloth was rinsed well and the number of Dani was measured under the microscope.

[0042] (Recovery) Installing 500 Dermatophagooides pteronyssinus, the Acari attractant was not sprinkled, but measured the number of Dani in the carpet fragment which did not perform cleaning with a cleaner, either, and computed recovery by the bottom type. The average of recovery was 81% as a result of performing a trial repeatedly 3 times.

Recovery (%) = (measured number of Dani) / (number of installation Dani) × 100[0043] (Dani elimination factor) It asked for the Dani elimination factor from the number of installation Dani in each example and the example of a comparison, the measured number of Dani, and the above-mentioned recovery. The trial calculated a repeat deed and its average 3 times.

Dani elimination factor (%) = (number of installation Dani - measured number of Dani / recovery) / (number of installation Dani) × 100[0044] The result of the model carpet trial in examples 1-4 and the examples 1-4 of a comparison was shown in a table 1. Moreover, it was shown in a table 1, having used as x the case where it was difficult and attraction with O and a cleaner was hard to use the feeling of an activity of the attractant at the time of a model carpet trial when good.

[0045]

[A table 1]

	ダニ駆除率 (%)	使用感
実施例1	72	O
実施例2	81	O
実施例3	64	O
実施例4	80	O
比較例1	5	O
比較例2	9	O
比較例3	65	x
比較例4	69	x

[0046] each 1 [two], the carpet of the sitting room of T house which are <field carpet trial> (example 5) ordinary homes, and the carpet of the study room of S house, -- m2 -- the Acari attractant (the thing which made 150mg (Wako Pure Chem make the 1st class) of benzyl propionates hold to MIZUKA night HQ-3(product made from Mizusawa chemistry, particle diameter of 3mm)1g was sprinkled so that it might become homogeneity.) After leaving it for 3 hours, with the home vacuum cleaner (Dancing Girl 510, SANYO Electric Co., Ltd. make), it applied for 20 seconds and cleaned up.

[0047] (The number measurement of Dani) The vacuum cleaner bag of a home vacuum cleaner was taken out, Dani's polypide was classified out of house dust, and it observed under the microscope. Each measurement result is shown in a table 2.

[0048] (Example 5 of a comparison) each 1 [two / which adjoins 2 1m each], the carpet of the sitting room of T house used in the example 4, and the carpet of the study room of S house, -- m2 With the home vacuum cleaner (Dancing Girl 510, SANYO Electric Co., Ltd. make), it applied for 20 seconds and cleaned up. The number measurement of Dani was performed like the example 4. Each measurement result is shown in a table 2.

[0049]

[A table 2]

	計測されたダニ数(匹)	
	T家の居間の絨毯	S家の書斎の絨毯
実施例5	803	597
比較例5	211	122

[0050]

[Effect of the Invention] Since they consist of an above-mentioned configuration, the Dani attractant and the extermination approach of this invention are high, and Acari which has hung on to the depths sections and fiber, such as a tatami, a carpet, and bedding, can also be attracted, and the induction effect of Acari can bring them together in the surface section which is the attractant circumference, and can exterminate them effectively. And since attraction extermination of attracted Acari can be carried out with an attraction machine, its handling is simple and can exterminate it promptly.

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(54) 【発明の名称】 ダニ誘引剤およびダニ駆除方法

(57) 【要約】

【課題】 置、絨毯、布団などの深層部に潜むダニ類に
対しても顕著なダニ誘引性を示す誘引剤及びこれを用い
た効率的なダニ駆除方法を提供する。

【解決手段】 常温で液体であるダニ類の誘引物質を
容積が $5 \times 10^{-4} \text{ m m}^3 \sim 350 \text{ m m}^3$ である固体担体
に保持させてなるダニ誘引剤、及びこれを用いた駆除方
法。

【特許請求の範囲】

【請求項1】 常温で液体であるダニ類の誘引物質を、容積が $5 \times 10^{-4} \text{ mm}^3 \sim 350 \text{ mm}^3$ である固体担体に保持させてなることを特徴とするダニ誘引剤。

【請求項2】 上記常温で液体であるダニ類の誘引物質が、

テトラヒドロゲラニオール、ゲラニオール、ネロール、リナロール、シトロネロールの群から選ばれる1種と、酢酸、プロピオン酸、酪酸、イソ酪酸の群から選ばれる1種とのエステル類、プロピオン酸ベンジル、ネロリドール、テルビネオール、n-ノニルアルコール、ファルネソール、シトラールジエチルアセタール、ゲラニルアセトン、テトラヒドロゲラニオール、ゲラニオール、ネロール、リナロール、シトロネロールからなる群より選ばれる1種以上の化合物であることを特徴とする請求項1記載のダニ誘引剤。

【請求項3】 請求項1又は2記載のダニ誘引剤を、畳、絨毯、布団などに散布することによりダニ類を誘引し、後にこの誘引剤と誘引されたダニとを吸引機にて吸引駆除することを特徴とするダニ類駆除方法。

【発明の詳細な説明】

【0001】

【発明の属する技術分野】 本発明はダニ類に対して高い誘引効果を有するダニ誘引剤およびダニ駆除方法に関するものである。

【従来の技術】 近年、冷暖房の普及のため一年中快適な温度空間が実現し、また住居の居住性の向上と共に密閉性が高まり湿度の上昇を招いている。これらのため、アレルギー疾患の原因となる住居内性ダニ類、ことに室内塵中に多いチリダニの、一般家庭内での繁殖が顕著となっておりその駆除が求められている。また、湿度の上昇に伴い室内にカビが発生し易い条件となっており、このカビを餌にコナダニの発生が促される。コナダニは上記チリダニと同様アレルゲンとなる他、ツメダニなどの捕食性ダニの餌となり、一般家庭における刺咬被害を引き起こす。従来、これらのダニを駆除する方法としては、殺ダニスプレー剤を散布する、殺ダニ燐煙剤の燐煙などの化学的方法あるいは、加熱する、掃除機で吸引捕獲するなどの物理的方法が採られている。

【0002】 しかしながら、殺ダニスプレー剤や殺ダニ燐煙剤を使用した場合では、畳、絨毯、布団などの内部にまでは薬物が浸透しにくいため、殺ダニ効果が充分でなく、また、仮に、ダニを殺すことが出来たとしても、その内部にダニの死骸が残り、徐々に生活空間に排出され、アレルギー疾患の原因となる。また、加熱駆除は、畳、絨毯、布団などを加熱器に入れるため、大がかりな加熱器が必要であり、一般家庭で使用するのは困難である。掃除機で吸引捕獲する方法は、簡便な方法ではあるが、この方法では表層部のごく一部のダニは捕獲できるものの、深層部にいるものや、繊維にしがみついている

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ステル、バルミチン酸エステル、リノール酸エステルなどの脂肪族エステル類、ステアリン酸、オレイン酸、バクセン酸などの直鎖脂肪酸類、 β -アカリジアールなどの性フェロモンなどが挙げられる。その中で特に好ましくは、テトラヒドログラニオール、グラニオール、ネロール、リナロール、シトロネロールの群から選ばれる1種と、酢酸、プロピオン酸、酪酸、イソ酪酸の群から選ばれる1種とのエステル類、プロピオン酸ベンジル、ネロリドール、テルビネオール、n-ノニルアルコール、ファルネソール、シトラールジエチルアセタール、ゲラニルアセトンである。これらは単独で用いても2種以上を併用してもよい。

【0007】また、本発明における常温とは15~25°Cをいう。

【0008】上記誘引物質の使用量としては、畳、絨毯、布団などの被ダニ駆除物1m²あたり5mg~10gで揮散できるように、固体担体に保持する量を設定するのが好ましい。揮散量が1m²あたり5mg未満であった場合、充分な誘引効果が得られず、また、1m²あたり10gを越える場合には、匂いが強く不快であったり、被ダニ駆除物に誘引物質を染み付き変質させる原因となるなどの不具合が起こる。

【0009】上記誘引物質を下記する固体担体へ保持させる方法は、特に限定されず、例えば、常温で液体である上記誘引物質に固体担体を一定時間浸せきする方法、誘引物質を固体担体にスプレーする方法などが挙げられる。

【0010】上記誘引物質の揮散性を調整するためには、固体担体の誘引物質保持量を調整する以外にも、エタノールなどの揮散性向上剤、グリコールなどの揮散性抑制剤を誘引物質と共に担体に保持させることも有効である。

【0011】本発明における固体担体は、その容積が5×10⁻⁴mm³~350mm³であることが好ましく、さらに好ましくは、4×10⁻⁴mm³~125mm³である。容積が、5×10⁻⁴mm³未満であると、ダニを吸引機にて吸引駆除する場合に、畳、絨毯、布団などの隙間などに入り込み、吸引除去することが困難になる。また、350mm³を越えると、大きな径の吸引機が必要となり、やはり、吸引除去が簡便でなくなってしまう。

【0012】上記固体担体の形状は、特に限定されず、例えば球形、扁平、針状などいかなる形をしていてもよい。

【0013】本発明における固体担体の材質としては、上記誘引物質を保持できるものであれば特に限定されず、例えば、シリカゲル、活性炭、ヒドロキシアバタイト、アルミナ、ゼオライト、ケイ酸カルシウム、炭酸カルシウム、重曹、珪藻土、粘土鉱物、ゲル剤、バルブ成型品、紙、不織布、纖維、樹脂およびこれらを混合した

ものなどが挙げられる。

【0014】上記固体担体の使用量としては、畳、絨毯、布団などの被ダニ駆除物1m²あたり0.5~100gであることが好ましい。0.5g未満では、均一に散布することが難しく効果的にダニを誘引することが出来ず、100gを越えて使用した場合には、畳、絨毯、布団などに散布する手間が多くなり、使用上問題がある。

【0015】本発明のダニ類誘引剤には、必要に応じて着色料などを添加し、着色させることができる。特に、ダニ類誘引剤が透明な場合には、畳、絨毯、布団などに散布した散布状況をわかりやすくするために、着色させることが好ましい。上記、着色料としては、例えば赤色2号、青色1号、赤色202号、黄色201号、緑色204号、紫色201号などの有機色素、アルミニウム末、タルク、カオリン、ベントナイト、マイカ、チタン、ベンガラ、カラミンなどの無機色素が挙げられる。これらの着色料は、単独で用いても、2種以上を併用してもよい。

【0016】また、本発明のダニ類誘引剤には、必要に応じて、ダニ類誘引効果を損なわない程度の、従来公知の化合物を含有してもよい。このような化合物としては、例えば、防虫剤、共力剤、ネズミ忌避剤、酸化防止剤、分解防止剤が挙げられ、さらに各種の殺菌剤、防カビ剤、害虫忌避剤、消臭剤、防腐剤を添加してもよい。

【0017】上記殺菌剤としては、特に限定されず、例えば、塩化ベンザルコニウム、塩化ベンゼトニウム、塩化アルキルトリメチルアンモニウム、レゾルシン、フェノール、ソルビン酸、ソルビン酸カリウム、サリチル酸、ヘキサクロロフェン等が挙げられる。これらの殺菌剤は、単独で用いても、2種以上を併用してもよい。

【0018】上記防カビ剤としては、特に限定されず、例えば、2,4,4'-トリクロロ2'-ハイドロキシジフェニルエーテル等が挙げられる。これらの防カビ剤は、単独で用いても、2種以上を併用してもよい。

【0019】上記害虫忌避剤としては、特に限定されず、例えば、2,3,4,5-ビスピチレン-テトラヒドロフラール等が挙げられる。これらの害虫忌避剤は、単独で用いても、2種以上を併用してもよい。

【0020】上記消臭剤としては、特に限定されず、例えば、ラウリル酸メタクリート、各種フラボノイド等が挙げられる。これらの消臭剤は、単独で用いても、2種以上を併用してもよい。

【0021】上記防腐剤としては、特に限定されず、例えば、p-オキシ安息香酸メチル、p-オキシ安息香酸エチル、安息香酸、安息香酸ナトリウム等が挙げられる。これらの防腐剤は、単独で用いても、2種以上を併用してもよい。

【0022】本発明におけるダニ駆除方法は、本発明のダニ誘引剤を、畳、絨毯、布団などに散布することによ

りダニ類を誘引し、後にこの誘引剤と誘引されたダニとを駆除する。

【0023】本発明のダニ誘引剤を散布する方法としては、特に限定されず、手などでばらまいても、一定間隔で均一に設置してもかまわないが、畳、絨毯、布団など全体をダニ駆除する場合には、各ダニ誘引剤同士が1m以内になるように散布することが好ましい。1mを越えて散布した場合は、畳、絨毯、布団など全体からダニを誘引することが困難になる。

【0024】ダニ誘引剤を散布した後、駆除するまでのダニ類を誘引する時間は、10分以上であることが好ましい。ダニの誘引物質が畳、絨毯、布団などに充分に浸透し、また、誘引物質がダニ類に作用することにより、ダニが表層に誘引されるためには10分以上必要である。更に好ましくは1時間以上である。

【0025】ダニを誘引した後に、この誘引剤とダニ類とを駆除する方法は、特に制限されず、吸引機で吸引駆除したり、箒で掃く等の方法が用いられる。その中でも特に吸引機にて吸引駆除する方法を用いることが好ましい。吸引駆除に使用する機具としては、特に限定されず、例えば、家庭用の電気掃除機を使用するのが簡便であるが、真空ポンプなどを利用した吸引機を利用することも可能である。

【0026】本発明のダニ類駆除方法としては、ダニ類誘引物質を保持させた固体担体の表面に粘着剤を塗布しておく、あるいは固体担体の近傍に粘着剤を塗布したシート、ピーズなどを設置しておき、誘引されてきたダニ類を粘着剤にて捕獲した後、吸引機にて、吸引除去させることも可能である。上記粘着剤としては、特に限定されず、例えばアクリル系、ゴム系の粘着剤および、寒天、粘土鉱物ゲルなどの粘着性を有する物質を使用することが出来る。

【0027】本発明によるダニ類誘引剤は、既存殺ダニ成分と混合、もしくは両者を併用して使用することも可能である。すなわち、ダニ類誘引剤でダニ類を畳、絨毯、布団などの表層に誘引し、殺ダニ成分にて殺した後、吸引機にて、吸引除去させることができる。上記殺ダニ成分としては、特に限定されず、例えば、ビレスロイド系、有機リン系、カーバメート系、植物精油などが挙げられる。

【0028】本発明のダニ類駆除方法は、既存のダニ検出・検知方法、装置と組み合わせることも可能である。これら既存のダニ検出・検知方法、装置形態は特に限定されないが、例えば、吸引機で吸引した後のダニ類およびダニの尿、糞などを、ダニ類虫体や体液中の成分などと反応して発色する試薬を用いてダニを検知する方法、装置などが例示できる。また抗原抗体反応を利用した検出方法、装置も使用できる。

【0029】本発明において対象となるダニ類は、節足動物-蛛形綱-ダニ目の生物で、主に7つの亜目に分か

れている。アシナガダニに代表される背気門。カタダニに代表される四気門。ヤマトダニ、ツバメヒメダニに代表される後気門。イエダニ、スズメサシダニに代表される中気門。クワガタツメダニ、ナミホコリダニに代表される前気門。ケナガコナダニ、ヤケヒヨウヒダニに代表される無気門。イエササラダニ、カザリヒワダニに代表される隠気門。いずれの種類でも対象となり得る。

【0030】(作用)本発明におけるダニ誘引剤は、上述のような構成であり、ダニ誘引物質が常温で液体の化合物を使用している。これは、ダニ類を誘引するためには、常温で固体状の誘引物質では、揮散性に乏しく、畳、絨毯、布団などに散布した場合、その内部にまで誘引物質が浸透しにくいため、ダニ類に充分に作用せず、誘引効果がほとんど認められず、一方、ダニ類の誘引剤が、常温で気体である場合には、家庭で、畳、絨毯、布団などに作用させることが難しいためである。また、上記ダニ類の誘引物質を、容積が $5 \times 10^{-1} \text{ mm}^3$ ~ 350mm³である固体担体に保持させてなるが、ダニ類を誘引するためには、10分~1時間程度必要であるため、上記したような固体担体に保持することで、誘引物質の揮散量を調整でき、誘引物質をダニ類に持続的に作用させることができるのである。本発明のダニ駆除方法では、ダニ類誘引剤を畳、絨毯、布団などに散布し、ダニ類を誘引し、後に誘引剤とダニとを吸引機にて吸引駆除するが、これにより、被駆除物の、深層部にいるダニ類までも吸引駆除することが可能となる。

【0031】

【実施例】以下に実施例を挙げて、本発明をさらに詳しく説明するが、本発明はこれら実施例に限定されるものではない。

【0032】(実施例1)ダニ類の誘引物質としてプロピオン酸ベンジル(和光純薬社製、1級試薬)150mgを固体担体であるミズカナイトHQ-3(水澤化学社製、粒子径3mm、容積14mm³)1gにスプレーにより保持させたものをダニ類誘引剤とした。

【0033】(実施例2)ダニ類の誘引物質として酢酸ゲラニル(和光純薬社製、1級試薬)100mgを固体担体であるB型シリカゲル(東海化学製、粒子径4mm、容積34mm³)400mgにスプレーにより保持させたものをダニ類誘引剤とした。

【0034】(実施例3)ダニ類の誘引物質であるネロリドール(和光純薬社製1級)500mgを固体担体であるフローライトRM-20(トクヤマ製、粒子径2mm、容積4mm³)2gにスプレーにより保持させたものをダニ類誘引剤とした。

【0035】(実施例4)ダニ類の誘引物質である酢酸ゲラニル(和光純薬社製1級)100mgとプロピオン酸ベンジル(和光純薬社製1級)80mgを混合したものを、固体担体であるミズカナイトHQ-3(水澤化学社製、粒子径3mm)1gに保持させたものをダニ類誘引剤

とした。

【0036】(比較例1)ダニ類誘引剤を使用しないで、下記モデル絨毯試験を行った。

【0037】(比較例2)固体状のダニ類誘引物質であるエビオス(アサヒビル社製)を粒子径1mm(容積0.5mm³)に成形したもの2gをダニ類誘引剤として使用した。

【0038】(比較例3)ダニ類の誘引物質であるプロピオン酸ベンジル(和光純薬社製、1級試葉)1gを固形担体である麦飯石(比果産業製、粒子径9mm、容積381mm³)5gにスプレーにより保持させたものをダニ類誘引剤とした。

【0039】(比較例4)ダニ類の誘引物質である酢酸ゲラニル(和光純薬社製1級)100mgを固形担体であるケイ酸カルシウムを粉碎し、粒子径50~80μmにふるい分けしたもの0.5gに保持させたものをダニ類誘引剤とした。

【0040】<モデル絨毯試験>市販の絨毯(ポリプロピレン製)を30cm×30cmに切断し、切断した絨毯断片にヤケヒヨウヒダニ500匹を設置する。1晩放置した後、上記実施例1~4及び比較例2~4のダニ類誘引剤を均一になるように散布する。3時間放置した後、家庭用電気掃除機(舞姫510、三洋電機株式会社製)で約10秒間かけて絨毯断片を掃除し、以下の試験を行い、ダニ除去率を求めた。

【0041】(ダニ数計測)絨毯断片に、同じ大きさの木綿布を被せ、表面温度55°Cに調整したホットプレート上に載せて、1時間加熱し、ダニを木綿布に追い出す。次に木綿布をよく水洗し、ダニ数を顕微鏡下で計測した。

【0042】(回収率)ヤケヒヨウヒダニ500匹を設置し、ダニ類誘引剤は散布せず、掃除機による掃除も行わなかった絨毯断片におけるダニ数を計測し、下式により回収率を算出した。試験は3回繰り返し行った結果、回収率の平均値は81%であった。

$$\text{回収率} (\%) = (\text{計測されたダニ数}) / (\text{設置ダニ数}) \times 100$$

【0043】(ダニ除去率)各実施例および比較例での設置ダニ数、計測されたダニ数および上記回収率よりダニ除去率を求めた。試験は3回繰り返し行い、その平均値を求めた。

$$\text{ダニ除去率} (\%) = (\text{設置ダニ数} - \text{計測されたダニ数} / \text{回収率}) / (\text{設置ダニ数}) \times 100$$

【0044】実施例1~4及び比較例1~4におけるモデル絨毯試験の結果を表1に示した。また、モデル絨毯試験時の誘引剤の使用感を、良好な場合は○、掃除機に

よる吸引が難しく使用しづらい場合を×として表1に示した。

【0045】

【表1】

	ダニ駆除率 (%)	使用感
実施例1	72	○
実施例2	81	○
実施例3	64	○
実施例4	80	○
比較例1	5	○
比較例2	9	○
比較例3	65	×
比較例4	69	×

【0046】<フィールド絨毯試験>

(実施例5)一般家庭であるT家の居間の絨毯、S家の書斎の絨毯の2カ所の各1m²に、ダニ類誘引剤(プロピオン酸ベンジル(和光純薬社製1級)150mgをミズカナイトHQ-3(水澤化学製、粒子径3mm)1gに保持させたものを均一になるように散布した。3時間放置した後、家庭用電気掃除機(舞姫510、三洋電機株式会社製)で20秒間かけて掃除した。

【0047】(ダニ数計測)家庭用電気掃除機の集塵袋を取りだし、室内塵の中からダニの虫体をより分け、顕微鏡で観察した。それぞれの計測結果を表2に示す。

【0048】(比較例5)実施例4で使用したT家の居間の絨毯、S家の書斎の絨毯の2カ所の各1m²に隣接する各1m²を家庭用電気掃除機(舞姫510、三洋電機株式会社製)で20秒間かけて掃除した。実施例4と同様にダニ数計測を行った。それぞれの計測結果を表2に示す。

【0049】

【表2】

	計測されたダニ数(匹)	
	T家の居間の絨毯	S家の書斎の絨毯
実施例5	803	597
比較例5	211	122

【0050】

【発明の効果】本発明のダニ誘引剤及び駆除方法は、上述の構成によりなるので、ダニ類の誘引効果が高く、畳、絨毯、布団などの深層部や纖維にしがみついているダニ類をも誘引し、誘引剤周辺である表層部に集めて効果的に駆除することができる。しかも誘引されたダニ類は、吸引機により吸引駆除することができるため、取り扱いが簡便で、迅速に駆除することができる。

フロントページの続き

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